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gration of enterprising and industrious people, in sufficient numbers so as to exercise a controlling influence, would in a few years effect a great change for the better, and place the State in the line of progress. The average Floridian of to-day understands only one thing, and that is "how *not* to do it." Emigration should be by colonies, and should include some mechanics, and be well provided with all necessary agricultural and mechanical implements and material, in order to be successful, and great care should be exercised in the selection of a location.

The trip to Florida, of which these "Rambles" afford a mere outline, was not devoid of scientific interest, and the results will be made known at some future time, either in the *NATURALIST* or some other appropriate publication.

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## THE NATURALIST IN CALIFORNIA.

BY J. G. COOPER, M. D.

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### NO. II.

*The Colorado Valley in winter.*—I arrived at Fort Mojave, after a journey of sixteen days from Los Angeles,\* on December 19th, 1860. This post is situated close to latitude 35°, where the boundary line of California strikes the river, and although on the Arizonian side, has, probably, no species of animals not also living on the west bank of the river, unless *Lepus callotis* be an exception. This, the Texan hare, I found common there, while *L. Californicus* is the prevalent, if not the only large species westward. The valley of the Colorado at this post is, probably, ten miles in width, and formed of a succession of gravelly terraces, or *mésas*, with a narrow sandy bottom intervening,

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\*Not Angelos, as printed before. Spanish, not Italian.

not over a mile wide. The whole upland has a most barren and desolate aspect, the only vegetation being low shrubs of the fetid *Larrea Mexicana*, with cacti and other thorny plants beneath. The bottom land, however, supports a vigorous growth of cottonwood, willows, and mesquite, a name applied there to two quite different trees, the *Algarobia glandulosa* and *Strombocarpa pubescens*. Dense shrubbery and coarse grasses cover most of the ground, even under the darkest shade, though spots are sometimes too alkaline for any vegetation except a few sea-shore plants, and in places the winds keep up a rolling waste of sand hills. The river itself is so low in winter that the Indians can wade across with their heads above water, and is so muddy as to fully deserve its name.

After my desert experience, I gazed with delight on the broad flashing stream, with its forest-clad banks, even though the trees were then bare, and the whole country nearly of the same brown tint as the river, for I knew that the very barrenness of the surrounding regions must drive most of the animal life to the river banks, one class in search of vegetable food the other to prey upon the former, while such as loved water must necessarily seek it here. And, with the exceptions mentioned as desert animals in my former article, nearly all of the higher animals are confined to this narrow belt of timber, stretching along the course of the Colorado from its Great Cañon, thirty miles higher up, down to its mouth. Those living permanently on the uplands must depend on a very scanty supply of dew for water during most of the year.

I must remark here that in climate this region belongs to Mexico, the winter being the *dry* season, and the summer subject to violent thunder storms from the south, but not *wet*, the whole annual rain not exceeding three or four inches, of which perhaps *one* falls in winter. The temperature rarely falls below the freezing point in latitude 35°, although the surrounding mountains were white with snow

on several occasions during January. The elevation of the river at this point is not over 550 feet, and the whole bottom land is inundated nearly every summer. The distance by the course of the river from its mouth is 400 miles.

The fauna of the valley naturally partakes much of the Mexican (west slope) character, and has some peculiarities. It is too limited and too liable to inundation for many land mammalia to flourish in it, except such as are common to the neighboring deserts and mountains. A second species, at present known no farther west, is the Leaf-nosed Bat (*Macrotus Californicus*) from Fort Yuma. This bat, like the birds, is independent of floods, and is probably migratory southward in winter, like two species I obtained at Fort Mojave—the Pale Bat (*Antrozous pallidus*), and a small species of *Vespertilio* which did not appear until March 15th, though the climate was warm enough for weeks before.

On walking out with my gun I was struck with surprise at the great numbers of Abert's Finch (*Pipilo Abertii*) frequenting the grove, the flocks flitting before me like dry leaves before the wind, their color exactly resembling the prevailing hue of the foliage covering the ground, and now densely coated with brown dust. It recalled the observation I had often made as to the prevalence of this brown hue in so many birds of California, of different genera and families, but agreeing in their habit of living in low shrubbery which has the same brown and dusty tint for eight or nine months of the year. The loud call or alarm note of this bird was strikingly different from the notes of its more silent cousin near the coast, the *P. fuscus* (or *crissalis*), but I soon noticed another strange fact, namely, that this note was also uttered by two other very distinct birds of dissimilar habits, the Shining Flycatcher and Gila Woodpecker (*Centurus uropygillus*), both of which were abundant and feeding together on the berries of the mistletoe, parasitic on almost every tree. These birds were my first specimens, together with the common Grass Finch (*Poocetes grami-*

*neus*) and Chipping Sparrow (*Spizella socialis*), which were wintering there in small flocks.

Next day I was disgusted to find my specimens damaged by mice, and, on setting a trap, soon secured some which I cannot distinguish, except by a lighter hue, from the common woodmouse of California (*Hesperomys Gambellii*). These, with several other rodents, had taken up their residence in the thatched roofs of our *adobé* quarters. On Christmas eve a little ice formed in the valley, but next morning the Brown Thrush (*Harporhynchus crissalis*) of this region was singing melodiously, and exactly in the style of its cousins east and west, so well known as "False Mocking Birds." It is another of the dead leaf-colored birds of the western regions, and is as strictly limited to the groves as its pale sandy-hued relative, *H. Lecontei*, is to the desert shrubbery.\*

The end of the year was cold and stormy for this latitude, so that no additions, except more northern migrants, were obtained among the birds, the most notable being the Oregon Snowbird (*Junco Oregonus*), and a few of the Meadow Lark (*Sturnella neglecta*), with several species of ducks and geese. In January, Swans (*Cygnus Americanus*) also appeared for a few days. On Jan. 10th I was both surprised and pleased to obtain a beautiful specimen of the Bohemian Waxwing (*Ampelis garrulus*), which had wandered so far from the mountains north-eastward, where the species abounds, and, probably driven by storms, had sought a temporary refuge in this far southern latitude. It was a solitary straggler, and even its cousin, *A. cedrorum*, never appeared there during my residence.

On the 16th a solitary Mexican Flycatcher (*Myiarchus Mexicanus*), evidently almost starved, gave a specimen of the summer group of migrants lingering in the valley

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\*I may here correct an error caused by the transposition of a line in my last article. "Corresponding in color to the rocks among which it lives," was intended for Harris's Squirrel, though it *would* apply pretty well to the Sage Fowl under which it is printed.

through the winter. Vegetation was just commencing to bud forth now, and I observed a few Doves and Cow-birds (*Molothrus pecoris*), apparently attracted by the opening spring, as none appeared before. I cannot enumerate all the species of vertebrates which now amounted to over fifty, as I collected them, but must notice only the more remarkable. The resident species not found westward of this valley were the Ladder Woodpecker (*Picus scalaris*), the White-bellied Wren (*Thriothorus leucogaster*), Gambel's Quail (*Lophortyx Gambellii*), the Arizona Song-sparrow (*Melospiza fallax*), the lead-colored Gnatcatcher (*Polioptila plumbea*), Malherbe's Flicker (*Colaptes chrysoides*), and the Yellow-headed Titmouse (*Auriparus flaviceps*). Besides these, most of the species before mentioned are resident, and also many common to the coast regions. Frosty nights throughout January seemed to prevent the appearance of any new birds. Even in February the new comers were only such as I know winter in more northern parts of California near the coast, though the thermometer rose to 80° on the 20th.

February 27th, a few Bank Swallows (*Cotyle riparia*, or *serripennis*\*) and bicolored Swallows (*Hirundo bicolor*) appeared. Even these last winter near the coast much farther north, to latitude 37°. It appears that there is little migration along this valley of the species common in summer near the coast, as they have to cross the deserts, and prefer a more western route. Some of the *winter* residents however became more scarce, probably seeking the mountains or high lands not more than a hundred miles distant, while the strong-winged hawks and swimmers may have gone even to the arctic regions.

*Spring*.—By March 2d, the poplars ("cottonwood") were in nearly full leaf, and beautiful flowers covered the richer

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\*Dr. Kennerley found this species here "abundant," February 21st, 1854. Also, the White-throated Swift (*Panyptila melanoleuca*), at William's Fork, February 16th, and Western Whippoorwill (*Autrostomus Nuttallii*), February 23d.

and warmer spots, chiefly in the ravines of the neighboring mountains. A duck was seen by an old resident on the river, which he said was very rare there, and from description was probably the long-legged Tree-duck (*Dendrocygna fulva*), since found to frequent the Sacramento Valley for nine months of the year, and to breed there; one of the few peculiarly western species. I shot or observed many other species of aquatic birds while here, but they furnished no very interesting facts. I obtained one each of the Red-necked and Williamson's Woodpeckers (*Sphyrapicus nuchalis* and *Williamsonii*), the only ones seen, and probably stragglers from the north.

I had been ten weeks at the post before I saw a single Burrowing Owl (*Athene cunicularia*), and then found only one pair, several miles distant, inhabiting a burrow evidently freshly dug by themselves. In the absence of the large burrowing squirrels, or other animals of similar size, they are sometimes compelled to burrow, but do not seem to increase in numbers in such localities. The general hardness of the soil on the upland is also an obstacle to their digging.

On March 10th I observed the first Hummingbird (probably *Atthis costæ*, which Dr. Kennerley found in February 1854, in the warmer valley of William's Fork), and the same day saw large flocks of geese migrating north. The first Rattlesnake (*Crotalus atrox*) was killed this day, and I obtained the first Horned Lizard (*Doliosaurus platyrhinos*). The weather now being very warm, flocks of cranes, swallows, and various winter residents were seen going northward daily. On the 15th I saw the first Bat and Western Whippoorwill, and on the 19th shot another Mexican Flycatcher, probably also a winter resident. There is evidently a constant moving northward of the winter residents, but apparently none from Mexico.

On March 22d I obtained the first seen of the Pale Sparrow (*Spizella pallida*\*), which seems to go farther south to

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\* Decidedly this and not *S. Brewerii*, which Coes supposes to replace it in Arizona and westwards.

winter than the *S. socialis*, but the first birds which I could consider as probably the leaders of the summer migration, were, as it happened, of a new species, viz., *Helminthophaga Luciae*, or Lucy's Warbler, which I shot at first sight on March 29th, the two first being males, and attracting my notice by their notes, as their small size and concealment in the dense mesquite thickets, which were just leafing out, would have otherwise prevented their discovery for a long time. They may even be winter residents in the valley like the allied *H. celata*.

The first nest I found with eggs was that of a Shrike (*Lanius excubitoroides*) on the 19th, and on the 26th obtained the first eggs of the Quail, of the Yellow-headed Titmouse (which builds an extraordinary closed nest of thorny twigs, like the magpies's in miniature), and of Abert's Pipilo.

Burrows were not uncommon which may have been made by Foxes or by the Badger (*Taxidea Americana*). On March 30th, visiting a steel trap which I had set for burrowing animals I was surprised to find in it a Swift Fox (*Vulpes velox*) caught by the toes. Having no way of securing it alive, I was obliged to make a dead specimen of it at once, fearing it might tear itself away. This is one of the mammalia which has not yet been detected west of the Colorado, though it undoubtedly exists there, and is indeed but a dwarf variety of the common Red Fox. Other mammals which I had obtained were Gambel's Woodmouse, before mentioned; Audubon's Hare (fur finer than near the coast, approaching *Lepus artemisiæ*), Coyoté (*Canis latrans*), killed by the dogs while running through the camp one moonlight night in January; Brush-tailed Rat (*Perognathus penicillatus*), quite common in the thatched roofs; Dark Woodmouse (*Hesperomys austerus*?), before found only in Washington Territory, but undistinguishable by descriptions; Boyle's Woodmouse, probably a mere long-tailed variety of Gambel's; the Mexican Woodrat (*Neotoma Mex-*



*icana*), common and very large; Phillip's Jumping-rat (*Dipodomys Phillippii*), common, and an invader of dwellings. The Texan Hare I have already mentioned. The Indians also brought in a fawn, apparently of the *Cervus Columbianus*, which seems to be the common species along the river, although others probably exist. They also brought a young antelope, of which herds were seen on the neighboring mesas during the short period of green vegetation in spring. A Wild-cat (*Lynx rufus*) was often seen at dusk about the post garden, where I attempted to shoot it but failed for want of light. My inquiries about the Californian Opossum found along the Mexican boundary, did not indicate its existence in this valley, though it will be found there if anywhere in California, nor did I learn of any other carnivorous mammals. Beavers are quite common in the river and grow to an enormous size; Gophers (*Thomomys fulvus*) are also common.

Compared with Kennerley's collections, in 1854, and Coues', in 1865, at Fort Whipple, the first quarter of 1861 must have been unusually cold. April proved to be the month for the arrival of the great body of summer birds, although a week before I saw what I took to be a Fork-tailed Flycatcher (*Milvulus forficatus?*), a species never yet obtained west of the Rocky Mountains, and a Scarlet Flycatcher (*Pyrocephalus Mexicanus*), which is a rare summer visitor, about which I could not be mistaken, though neither would allow of a near approach. I obtained the following, usually as soon as observed: April 2d, *Atthis costæ*; 3d, Bullock's Oriole (*Icterus Bullockii*); and saw an *Empidonax*, Barn Swallows, and Summer Yellow-bird; a ground Cuckoo (*Geococcyx Californianus*) laid an egg in its cage. 11th, shot an Obscure Flycatcher (*Empidonax obscurus*). 17th, Texan Nighthawk (*Chordeiles Texensis*), and saw the first eggs of Orioles. 24th, McGillivray's Warbler (*Geothlypis McGillivrayi*), Yellow-breasted Chat (*Icteria viridis*, not long-tailed), Arkansas Kingbird (*Tyrannus verticalis*).

25th, found the eggs of Common Doves. 26th, shot a new species of Owl (*Micrathene Whitneyi*) in a dark thicket. 28th, Summer Red-bird (*Pyrranga æstiva*). 29th, found a nest and two eggs of the Shining Flycatcher. In this month I saw an unknown species of Oriole in the high trees, like *Icterus Parisorum* Bonap.

On April 6th I trapped a squirrel, of a species which I had not before observed, a third larger than Harris', and dark-brown instead of gray, but with proportions and markings so exactly like the desert species, that, remembering the varieties of the Four-striped *Tamias*, I did not dare to consider this distinct. It was all I saw of the kind, which may be common in the wooded mountains of Arizona. On the 13th I obtained the first Pale Bat, before noted.

Reptiles had now become common in the valley, and were mostly distinct species from those of the deserts. Besides those mentioned, a large Fence Lizard (*Sceloporus magister*?), eight inches long, began to frequent the trees March 20th, and on the 23d, three young of my new Land Tortoise (*Xerobates Agassizii*) were brought from the mountains by Indians. The Thirsty Lizard (*Dipsosaurus dorsalis*) became common in the ravines near by, far from water. On the 30th I caught Graham's Salvadora (*S. Grahamii*), a pretty harmless snake living in the grassy valley. April 15th, Woodhouse's Toad\* first appeared on the drier banks; 17th, Churchill's Bull-snake (*Pituophis bellona*); 26th, Boyle's Milk-snake (*Lampropeltis Boylii*); 29th, the Coppery Whip-snake (*Masticophis testaceus*), and some very swift lizards (*Crotaphytus* sp.) which I did not succeed in catching, appeared on the desert plains.

On May 1st I shot the Little Flycatcher (*Empidonax pusillus*), which I then mistook for *E. Traillii*, but find by my notes that this one differed from a true specimen of the latter, shot on May 20th, in having the lower mandible brownish instead of yellowish and in proportions. It was lost, with

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\*Dr. Kennerley found toads at William's Fork, February 18th, 1854.

a valuable collection sent by the "Golden Gate," on the way to Washington, but I happened to reserve the other one, about the occurrence of which west of the Rocky Mountains there has been some discussion.\*

May 6th, shot the first Blue Grosbeak (*Guiraca caerulea*); 14th, the Blue-headed Greenlet (*Vireo solitarius*†), which Dr. Coues omits from the birds of Arizona, supposing it to be his *V. plumbeus*, which however is quite distinct, and one I did not obtain.‡

May 19th I found a nest of the Yellow-breasted Chat containing three eggs, besides one of the parasitic Cow-bird; on the 8th a nest of the House Finch, or Red Linnet (*Carduelis frontalis*), with eggs, and on the 19th that of the Song Sparrow (*Melospiza fallax*).§ May 20th I first saw the Blue Linnet (*Cyanospiza amœna*), and shot Hammond's and Traill's Flycatchers (*Empidonax hammondi* and *E.*

\* See Coues' List of Birds of Fort Whipple, Arizona, in "Proceedings of the Philadelphia Academy of Natural Science," January, 1866. Compare also Coues, in "Ibis," April, 1865, and July, 1866; Baird on Distribution of Birds, in "Silliman's Journal," and my article on Additions to the Fauna of California, in the "Proceedings of the California Academy of Sciences," IV, iii, November, 1868.

† Length 4.87; extent 9; wing 3 inches; bill black; lower mandible bluish; feet lead color; iris brown; male.

‡ I take this occasion to notice the prevalence of lead-gray among the arboreal birds of these arid regions, just as brown prevails among the more terrestrial. It replaces the brown, olive or greenish, in many species also found in moister and more wooded regions, while others, differing in other respects from their eastern representatives, are considered as distinct species peculiar to these regions. The Pigeon Hawk (*Falco columbarius*), Mottled Owl (*Scops asio* var. *McCallii*), Night Hawk (*Chordeiles popetue* var. *Henryi*), Icteria viridis var. *longicauda*, Thrithorus (*Bewickii* var. ?) *leucogaster*, *Poœcetes (gramineus* var. ?) *confinis*, *Melospiza (melodia* var. ?) *fallax*, *Sturnella (magna* var. ?) *neglecta*, and Ground Dove (*Chamæpelia passerina* var. *pallascens*), furnish examples of more or less marked differences in this respect from those of other regions. The gray species as usually recognized, are the Hare Hawk (*Falco polyogrus*), Squirrel Hawk (*Archibuteo ferrugineus*), *Micrathene Whitneyi*, Nuttall's Whippoorwill (*Antrostomus Nuttalli*), Western Kingbirds (*Tyrannus vociferans* and *verticalis*), Say's Pewee (*Sayornis Sayus*), *Empidonax obscurus*, *Polioptila plumbea*, Grace's Warbler (*Dendroica Gracie* Coues) of Fort Whipple, *Helminthophaga Lucie*, Swainson's Vireo (*V. Swainsoni*), Lead-colored Vireo (*V. plumbeus*), Coues' Vireo (*V. vicinior*); these last three from Fort Whipple; Little Vireo (*V. pusillus*), Lead-colored Titmouse (*Psaltiriparus plumbeus*), Lawrence's Goldfinch (*Chrysomitris Lawrencei*), Pale Snowbird (*Junco caniceps*), all of which have darker-colored representatives either east of the Mississippi, or on the west coast, or both, while some of them extend their range to one or both of those natural boundaries.

§ The nesting, as well as the arrival of many birds, was from one to two months later than at San Diego in 1862.

*Traillii*); also, Richardson's Pewee (*Contopus Richardsonii*) and Black-cap Warbler (*Myiodioides pusillus*).\* The only mammals I obtained were a small Bat (*Vespertilio Yumanensis?*), and the typical gray variety of Harris' Spermophile, shot some miles from the river on May 28th, the day I started to return to the coast. The reptiles added were the Colorado Toad (*Bufo alvarius*), an enormous semiaquatic species nearly as smooth as a frog; and several others on the way westward which do not appear to inhabit the valley.

Fish seemed to be scarce in this muddy river, and I only obtained three species of cyprinoids: a large one called Colorado Salmon (*Ptychocheilus lucius*), a Gila (*G. robusta?*), and one allied to the Suckers (*Catostomus*). Mollusca were equally rare, and a few specimens of the remarkable *Physa humerosa* and *Planorbis ammon* were all I found. My collection of vertebrata made at Fort Mojave numbered 100 species, and 250 specimens.

I might enumerate many other species that have been obtained in the Colorado Valley by other collectors, but it would be too long a list. I have, altogether, counted up twenty-three species of mammals, one hundred and nineteen birds, and ten reptiles, as found there at various seasons, some of which I heard of as visiting Fort Mojave later than my stay there. By May 15th the spring rains were over and the short vegetation of the *mésas* was drying up. About this time also the river was rising rapidly, bringing down cold water from the mountains, and moderating the heat which had been as high as 116° in the shade on April 20th. The summer wind began to blow from the south, and would, probably, bring some of the latest birds with it, while others would come after the floods to seek the food left by the subsiding waters. Among these have been seen the strange Vulture-eagles (*Polyborus Audubonii* and

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\* On the 27th I saw the only one of the rare Western Warbler (*Dendroica peridentalis*), and the first Sea-green Swallows.

*Craxirex uncinatus*), the little Ground Dove, and the quaint Wood Ibis, called there "Colorado Turkey" (*Tantalus loculator*).

My object has been to give merely a sketch of the progress of the faunal seasons, as I saw them.

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## HINTS ON TAXIDERMY.

BY C. A. WALKER.

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[Concluded from page 201.]

*The method of skinning and mounting tortoises and turtles.*  
—By examining the exterior covering of this order it will be seen that it consists of two horny plates or shields, which are closely united at the sides, forming a protection to the soft parts of the body; the upper one is called the carapace, and the lower one the sternum or breast bone. Before commencing the operation of skinning it is necessary to separate these two plates by means of a strong knife, chisel, or other similar instrument, or a fine saw, taking great care to make the separation at the suture, as far as possible, and to avoid cracking the shell. After this operation has been finished remove all the flesh adhering to both the upper and under plates. The arrangement of the bones and muscles differs so essentially from that of the other orders of vertebrates that attention should be given to this point in removing the various parts. The fore and hind legs should be turned out, and all the flesh adhering to them removed, taking care not to separate these various parts from their attachments to the upper shell; also, the neck and head should undergo the same operation, the brain and eyes being removed. The inner surface should now be thoroughly cleaned by means of a stiff brush, and the preservative applied to every part, after which they may be restored to